Plotting

April 30, 2018

```
In [1]: import pandas as pd
        import matplotlib.pyplot as plt
        import folium
        from folium.plugins import HeatMap
        import seaborn as sns
        from scipy import stats
```

```
In [2]: df = pd.read_csv("Crimes_-_2001_to_present.csv")
```

```
In [3]: print(df[df['Year'] == 2005].Block.value_counts())
```

```
100XX W OHARE ST                       1271
023XX S STATE ST                        916
076XX S CICERO AVE                      732
001XX N STATE ST                        612
022XX S STATE ST                        575
063XX S DR MARTIN LUTHER KING JR DR     571
012XX N BURLING ST                      563
005XX E BROWNING AVE                    551
062XX S CALUMET AVE                     501
015XX W 13TH ST                         500
0000X N STATE ST                        495
029XX S STATE ST                        472
001XX W 87TH ST                         446
027XX S DEARBORN ST                     443
008XX N MICHIGAN AVE                    425
024XX W MONROE ST                       395
024XX S STATE ST                        375
006XX W DIVISION ST                     369
064XX S DR MARTIN LUTHER KING JR DR     364
027XX W OGDEN AVE                       341
012XX S WABASH AVE                      332
025XX W JACKSON BLVD                    324
015XX W HASTINGS ST                     299
027XX S STATE ST                        292
002XX W 87TH ST                         291
0000X W 95TH ST                         288
061XX S COTTAGE GROVE AVE               285
```

```
048XX W NORTH AVE                       272
036XX S FEDERAL ST                      272
032XX W ROOSEVELT RD                    269
                                       ...
001XX E 33RD BLVD                         1
090XX S GREEN BAY AVE                     1
043XX W BARRY AVE                         1
008XX S FRANCISCO AVE                     1
031XX W FRANKLIN SD                       1
043XX W AINSLIE ST                        1
020XX E 89TH ST                           1
053XX S NEWCASTLE AVE                     1
0000X N MORGAN ST                         1
110XX S ROCKWELL ST                       1
033XX N MOBILE AVE                        1
014XX E ROCHDALE PL                       1
039XX N KILBOURN AVE                      1
057XX S OAK PARK AVE                      1
010XX W 40TH ST                           1
037XX S RACINE AVE                        1
131XX S MANISTEE AVE                      1
014XX W 15TH ST                           1
086XX W FOREST PRESERVE AVE               1
073XX W LUNT AVE                          1
020XX N DOMINICK ST                       1
064XX N OLIPHANT AVE                      1
008XX E 115TH ST                          1
042XX W 17TH ST                           1
050XX N MARMORA AVE                       1
058XX S MERRIMAC AVE                      1
047XX W 44TH ST                           1
013XX W 122ND ST                          1
028XX W 81ST ST                           1
042XX W ARGYLE ST                         1
Name: Block, Length: 29090, dtype: int64
```

```
In [8]: print(df.columns.values)
```

```
['ID' 'Case Number' 'Date' 'Block' 'IUCR' 'Primary Type' 'Description'
 'Location Description' 'Arrest' 'Domestic' 'Beat' 'District' 'Ward'
 'Community Area' 'FBI Code' 'X Coordinate' 'Y Coordinate' 'Year'
 'Updated On' 'Latitude' 'Longitude' 'Location']
```

```
In [7]: small_df = df[df['Year'] == 2001]
        small_df = small_df[small_df['Block'] == '100XX W OHARE ST']
        small_df['Primary Type'].value_counts()
```

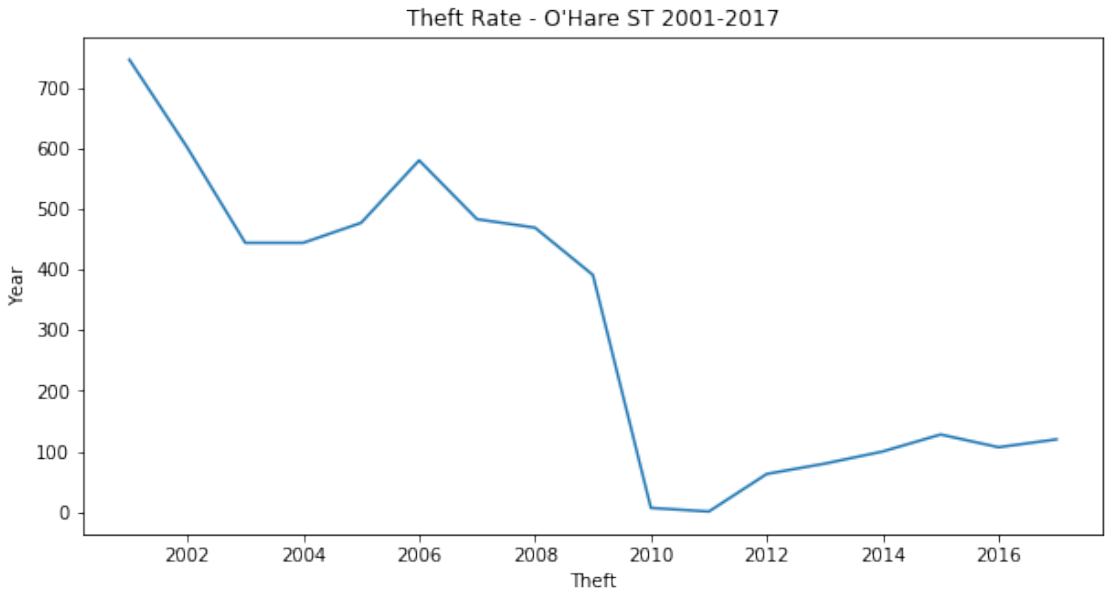
```
Out[7]: THEFT                          746
        DECEPTIVE PRACTICE             254
        CRIMINAL TRESPASS              198
        CRIMINAL DAMAGE                154
        MOTOR VEHICLE THEFT            135
        BATTERY                        134
        ASSAULT                         63
        WEAPONS VIOLATION               45
        NARCOTICS                       44
        OTHER OFFENSE                   44
        PUBLIC PEACE VIOLATION          18
        BURGLARY                        15
        SEX OFFENSE                      7
        LIQUOR LAW VIOLATION             3
        ROBBERY                          2
        OFFENSE INVOLVING CHILDREN       2
        PROSTITUTION                     1
        INTIMIDATION                     1
        Name: Primary Type, dtype: int64
```

```
In [94]: years = (2001,2002,2003,2004,2005,2006,2007,2008,2009,2010,2011,2012,2013,2014,2015,201
         Ohare = {}
         for year in years:
             small_df = df[df['Year'] == year]
             small_df = small_df[small_df['Block'] == '100XX W OHARE ST']
             Ohare[year] = small_df['Primary Type'].value_counts()
```

```
In [95]: print(Ohare[2001])
```

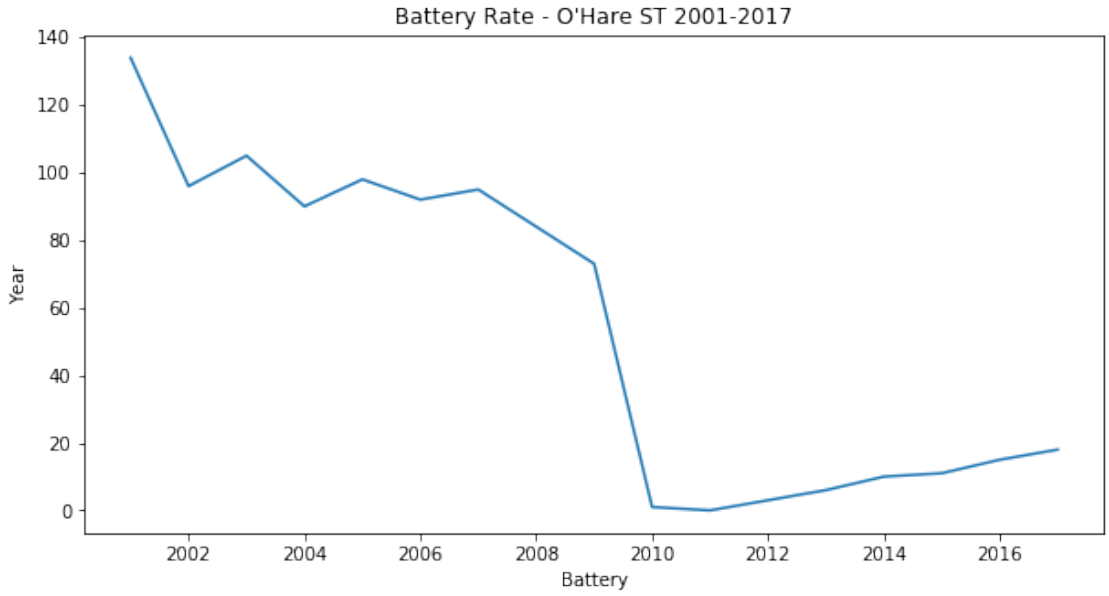
```
THEFT                          746
DECEPTIVE PRACTICE             254
CRIMINAL TRESPASS              198
CRIMINAL DAMAGE                154
MOTOR VEHICLE THEFT            135
BATTERY                        134
ASSAULT                         63
WEAPONS VIOLATION               45
NARCOTICS                       44
OTHER OFFENSE                   44
PUBLIC PEACE VIOLATION          18
BURGLARY                        15
SEX OFFENSE                      7
LIQUOR LAW VIOLATION             3
ROBBERY                          2
OFFENSE INVOLVING CHILDREN       2
PROSTITUTION                     1
INTIMIDATION                     1
Name: Primary Type, dtype: int64
```

In [96]:
```
Ohare_Theft = []
for year in years:
    Ohare_Theft.append(Ohare[year]['THEFT'])

fig, ax = plt.subplots(figsize=(10,5))
g = plt.plot(years,Ohare_Theft)
plt.title("Theft Rate - O'Hare ST 2001-2017")
plt.xlabel('Theft')
plt.ylabel('Year')
plt.savefig('theftohare.png')
plt.show()
```

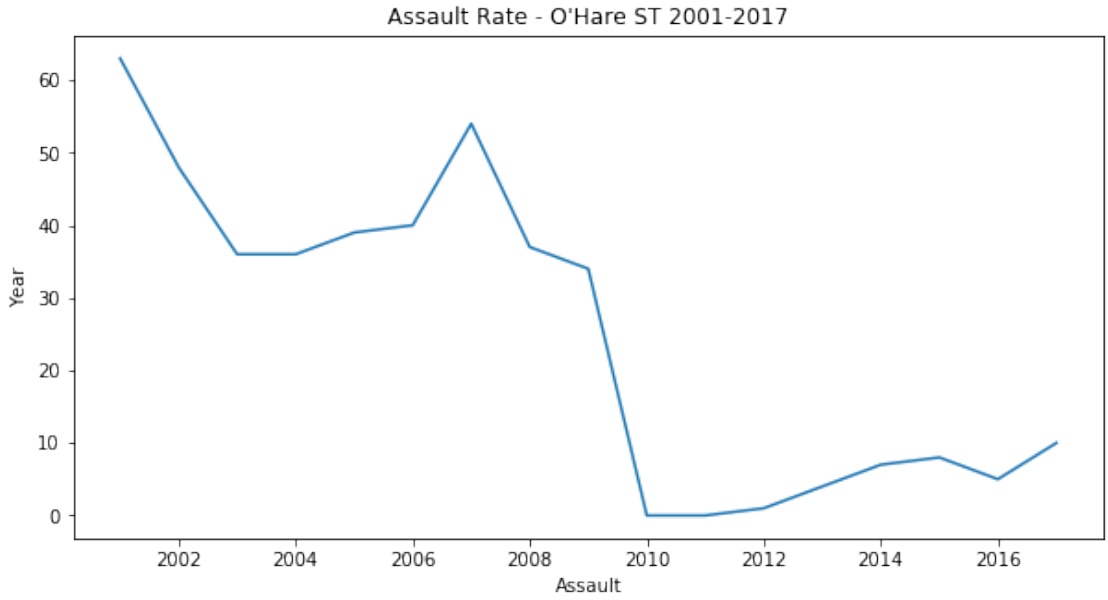


In [97]:
```
plot_list = []
for year in years:
    try:
        plot_list.append(Ohare[year]['BATTERY'])
    except:
        plot_list.append(0)
print(plot_list)
fig, ax = plt.subplots(figsize=(10,5))
g = plt.plot(years,plot_list)
plt.title("Battery Rate - O'Hare ST 2001-2017")
plt.xlabel('Battery')
plt.ylabel('Year')
plt.savefig('batteryohare.png')
plt.show()
```

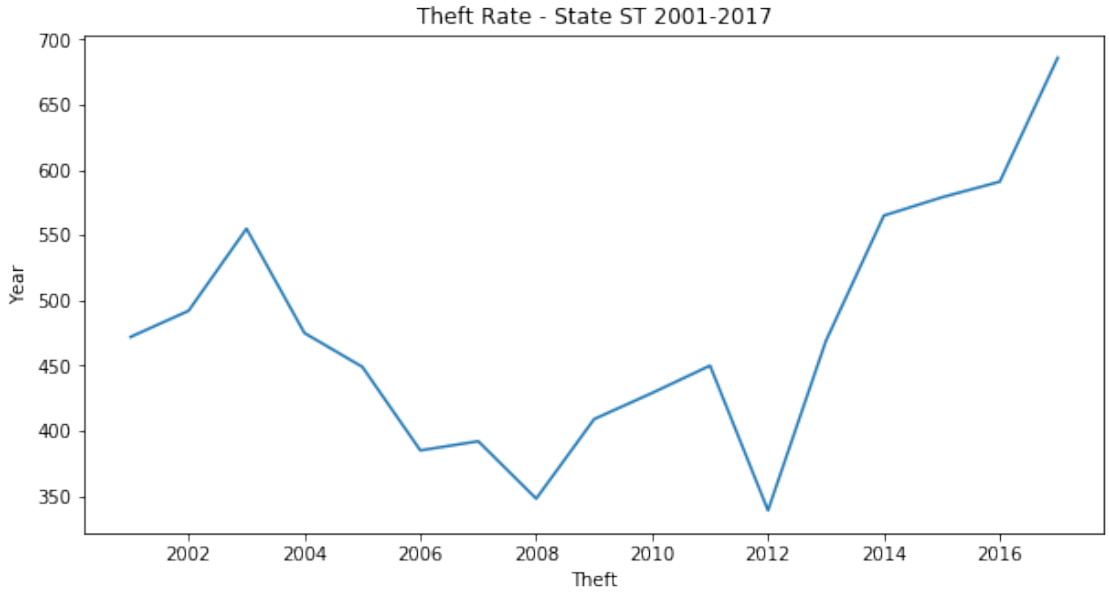
```
[134, 96, 105, 90, 98, 92, 95, 84, 73, 1, 0, 3, 6, 10, 11, 15, 18]
```



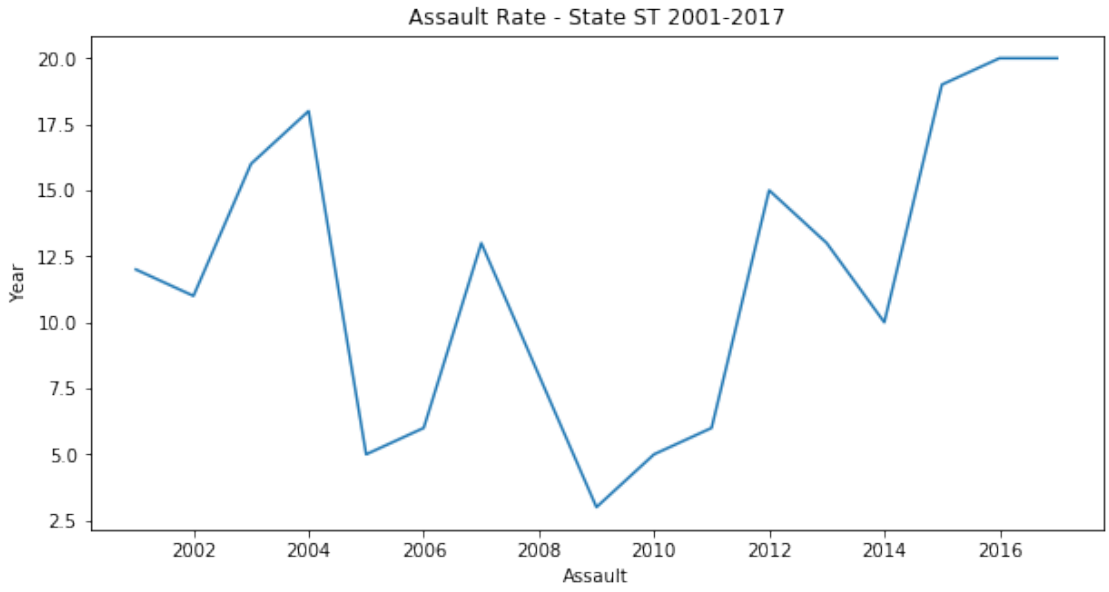

```
In [98]: plot_list = []
         for year in years:
             try:
                 plot_list.append(Ohare[year]['ASSAULT'])
             except:
                 plot_list.append(0)

         fig, ax = plt.subplots(figsize=(10,5))
         g = plt.plot(years,plot_list)
         plt.title("Assault Rate - O'Hare ST 2001-2017")
         plt.xlabel('Assault')
         plt.ylabel('Year')
         plt.savefig('Assaultohare.png')
         plt.show()
```



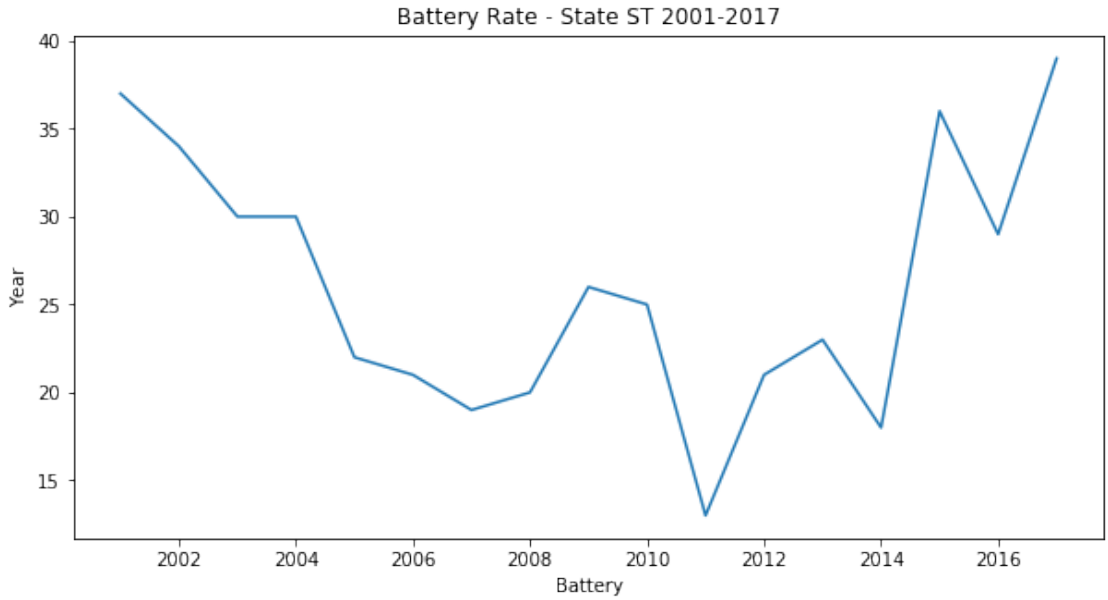

```
In [99]: State = {}
         for year in years:
             small_df = df[df['Year'] == year]
             small_df = small_df[small_df['Block'] == '001XX N STATE ST']
             State[year] = small_df['Primary Type'].value_counts()

In [100]: plot_list = []
          for year in years:
              try:
                  plot_list.append(State[year]['THEFT'])
              except:
                  plot_list.append(0)

          fig, ax = plt.subplots(figsize=(10,5))
          g = plt.plot(years,plot_list)
          plt.title("Theft Rate - State ST 2001-2017")
          plt.xlabel('Theft')
          plt.ylabel('Year')
          plt.savefig('TheftState.png')
          plt.show()
```




```
In [101]: plot_list = []
          for year in years:
              try:
                  plot_list.append(State[year]['ASSAULT'])
              except:
                  plot_list.append(0)

          fig, ax = plt.subplots(figsize=(10,5))
          g = plt.plot(years,plot_list)
          plt.title("Assault Rate - State ST 2001-2017")
          plt.xlabel('Assault')
          plt.ylabel('Year')
          plt.savefig('AssaultState.png')
          plt.show()
```




```
In [102]: plot_list = []
          for year in years:
              try:
                  plot_list.append(State[year]['BATTERY'])
              except:
                  plot_list.append(0)

          fig, ax = plt.subplots(figsize=(10,5))
          g = plt.plot(years,plot_list)
          plt.title("Battery Rate - State ST 2001-2017")
          plt.xlabel('Battery')
          plt.ylabel('Year')
          plt.savefig('batterystate.png')
          plt.show()
```


Battery Rate - State ST 2001-2017
Year
Battery
40
35
30
25
20
15
2002
2004
2006
2008
2010
2012
2014
2016